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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/533,449

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EXAMINER

GUGLIOTTA, NICOLE T

ART UNIT

PAPER NUMBER

1783

NOTIFICATION DATE

DELIVERY MODE

12/22/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/533,449	Applicant(s) KANEDA ET AL.	
	Examiner NICOLE T. GUGLIOTTA	Art Unit 1783	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 4, 6, 8, 24 - 26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4, 6, 8, 24 - 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 23, 2010 has been entered.

Examiner's Note

The Examiner acknowledges the addition of claim 26 and confirms no new matter has been added.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 1. Claim 26 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Applicant's claim 26 states, "...wherein the plugging material is formed from a pore forming agent having an amount of 0.1 to 20 parts by mass of a ceramic raw material". Claim 26 does not provide enough information to give a clear understanding

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of the final structure. Different pore forming agents, although used in the same amount, will produce a plug of different porosities when mixed with ceramic raw material.

Therefore, the claimed structure resulting from the addition of pore forming agent in claim 26 is indefinite.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4, 6, 8, 24, 25 & 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ichikawa et al. (U.S. Patent No. 5,595,581), as evidenced by Shaffer (U.S. Patent No. 4,904,625), in view of Hamanaka et al. (WO 2002/074417).

Note: US 2003/0140608 is the national stage application for WO 2002/074417, and has been cited below as the English language equivalent.

In regard to claims 1, 24 & 25, Ichikawa et al. disclose a honeycomb exhaust filter in which the porosity of the sealing members (corresponds to Applicants' "plugging material") of the exhaust gas filters is desired to be 110 – 140% of the porosity of the above honeycomb structure (corresponds to Applicants' "cell wall"), for maintaining a high collection efficiency and decreasing pressure losses (Col. 2, Lines 31 – 36).

Shaffer teaches the lower density (i.e. higher porosity) of a ceramic material contributes to a lower Young's Modulus and a higher thermal shock resistance (Col. 3, Lines 46 –

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48). Therefore, it stands to reason when the porosity of the plugging material is higher than that of the cell walls; the Young's Modulus of the plugging material is lower than that of the cell walls, such as in the honeycomb disclosed by Ishikawa et al.

Ishikawa et al. disclose the sealer of the sealing members of ceramic fibers, cordierite particles, LAS (lithium aluminosilicate) may be employed (Col. 6, Lines 21 - 24). Ishikawa et al. is silent in regard to the use of silicon carbide in the sealing members or ceramic members.

However, Hamanaka et al. disclose plugged (§ [0027]) ceramic honeycombs are preferably made of silicon carbide, or silicon carbide and metallic silicon because these materials are superior in heat resistance and thermal conduction (§ [0031]). In regard to the plugging material, Hamanaka et al. disclose the dried honeycomb member is comprised of the extruded honeycomb member and the plugging material (§ [0066]), and the ceramics are made of preferably metallic silicon and silicon carbide (§ [0032]). Therefore, it would be reasonable to believe the cells walls and the plugging material were both made of the same metallic silicon and silicon carbide composition. In addition, Hamanaka et al. teach the cell walls have thickness of 0.3 mm (300 μ m)(§ [0065]). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute silicon carbide and metallic silicon as the material of choice in a honeycomb used as a diesel exhaust filter because of its superior heat resistance and thermal conduction, as taught by Hamanaka et al.

In regard to claims 4 and 6, Ichikawa et al. disclose a porous cylindrical honeycomb structure with 45% porosity. Examiner places the burden upon the

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Applicant to demonstrate there is a patentable difference between 45% and 46% porosity for the cell walls.

In regard to claim 8, Ichikawa et al. disclose cells that are plugged in an alternating manner so as to form checkerboard patterns at the end faces (Figures 1 - 3). In addition, Hamanaka et al. disclose plugged cells (§ [0027]).

In regard to claim 26, Ichikawa et al. teach a plug of porosity of 60 – 65% for a number of their samples (Table 2-continued (Col. 5)).

Claim 26 defines the product by how the product was made. Pore forming agent is not present in the final structure of a honeycomb. It forms the pores by creating air pockets during sintering when it is burned off. As such, the pore forming agent only affects the porosity of the structure. Thus, claim 26 is a product-by-process claim. For purposes of examination, product-by-process claims are not limited to the manipulation of the recited steps, only the structure implied by the steps. See MPEP 2113. In the present case, the recited steps imply a plug structure having a porosity percentage greater than 58%, according to Applicant's Table 2, specification pg 32. Specifically, a porosity of 64% (corresponds to 3% by mass pore forming agent) or a structure having a porosity of 70% (corresponds to 5% by mass pore forming agent). The reference suggests such a product.

Examiner refers applicant to MPEP § 2113 [R - 1] regarding product-by-process claims. "The patentability of a product does not depend on its method or production. If the product in the product-by-process claim is the same as or obvious from a product or the prior art, the claim is unpatentable even though the prior product was made by a

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different process." *In re Thorpe*, 777, F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citation omitted)

Once the examiner provides a rationale tending to show that the claimed product appears to be same or similar to that of the prior art, although produced by a different process, the burden shifts to the applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 710 F.2d 798, 802, 218, USPQ 289, 292 (Fed. Cir. 1983)

3. Claims 1, 4, 6, 8, 24, 25 & 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hijikata (WO 2002/081880), as evidenced by Shaffer (U.S. Patent No. 4,904,625), in view of Ichikawa et al. (U.S. Patent No. 5,595,581).

Note: US 2004/0101654 A1 is the national stage application for WO 2002/081880, and has been cited below as the English language equivalent.

In regard to claims 1, 24 and 25, Hijikata discloses a honeycomb assembly made of silicon carbide powder. The cell wall thicknesses are 0.38 mm (380 μ m) (inside) and 0.25 mm (250 μ m)(outside) (Example 1). Hijikata further teaches same material used for the honeycomb segments should be used for the plugging material (Col. 8, Lines 13 - 15). Hijikata is silent in regard to the Young's modulus and porosity of the plugging material relative to the cell walls.

Ichikawa et al. disclose a honeycomb exhaust filter in which the porosity of the sealing members (corresponds to Applicants' "plugging material") of the exhaust gas filters is desired to be 110 – 140% of the porosity of the above honeycomb structure

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(corresponds to Applicants' "cell wall"), for maintaining a high collection efficiency and decreasing pressure losses (Col. 2, Lines 31 – 36). Shaffer teaches the lower density (i.e. higher porosity) of a ceramic material contributes to a lower Young's Modulus and a higher thermal shock resistance (Col. 3, Lines 46 – 48). Therefore, it stands to reason when the porosity of the plugging material is higher than that of the cell walls; the Young's Modulus of the plugging material is lower than that of the cell walls, such as in the honeycomb disclosed by Ishikawa et al. It would have been obvious to one of ordinary skill in the art at the time of the invention to adjust in the honeycomb disclosed by Hijikata the porosity of the plugging material to be 110 - 140% of the porosity of the cell walls (honeycomb structure) in order to maintain high collection efficiency and decrease pressure losses.

In regard to claims 4 and 6, Ichikawa et al. disclose a porous cylindrical honeycomb structure with 45% porosity. Examiner places the burden upon the Applicant to demonstrate there is a patentable difference between 45% and 46% porosity for the cell walls.

In regard to claim 8, Hijikata discloses the ends of the cells were alternately plugged, such that each end face looked like a checkerboard pattern (Col. 8, Lines 56 - 59).

In regard to claim 26, Ichikawa et al. teach a plug of porosity of 60 – 65% for a number of their samples (Table 2-continued (Col. 5)).

Claim 26 defines the product by how the product was made. Pore forming agent is not present in the final structure of a honeycomb. It forms the pores by creating air

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pockets during sintering when it is burned off. As such, the pore forming agent only affects the porosity of the structure. Thus, claim 26 is a product-by-process claim. For purposes of examination, product-by-process claims are not limited to the manipulation of the recited steps, only the structure implied by the steps. See MPEP 2113. In the present case, the recited steps imply a plug structure having a porosity percentage greater than 58%, according to Applicant's Table 2, specification pg 32. Specifically, a plug material of 3% by mass pore forming agent corresponds to a porosity of 64%, and a plug material of 5% by mass pore forming agent corresponds to a porosity of 70%. The reference suggests such a product.

Response to Arguments

4. Applicant argues, "Applicants respectfully submit that the Young's modulus of a material is not necessarily a function of the porosity of the material. In fact, other factors, such as particle size of the material and auxiliary agent, affect the Young's modulus. The current specification supports this position at page 12, lines 20-22, page 20, lines 13-16, and 16, lines 19-23. Specifically, the current specification discloses that when the type or amount of pore forming agent is changed, the porosity, Young's modulus or strength of the plugging material can be controlled. As such, an ordinary skilled artisan would not have understood that the higher porosity of the plugs in Ishihara would result in a lower Young's modulus of the plugs, as compared to the cell walls" (Remarks, Pg 5).

EXAMINER'S RESPONSE: Applicant's arguments have been fully considered but they are not persuasive. First, the Examiner agrees other factors besides porosity can affect the Young's modulus of a material. However, when considering the teachings of the prior art, if all other factors are the same in the plugging material and the cell walls disclosed by the prior art reference, than it would be reasonable to believe porosity alone will directly affect the difference in Young's modulus.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e. differences in particle size of the material and auxiliary agent between the plugging material and the cell walls) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Second, Applicant notes, "the current specification discloses that when the type or amount of pore forming agent is changed, the porosity, Young's modulus or strength of the plugging material can be controlled". This sentence is interpreted to mean that the amount of pore forming agent directly affects the porosity, which results in a change in Young's modulus or strength of the material. This quote from Applicant's specification further supports the Examiner's point. It would have been obvious to one of ordinary skill in the art that a higher porosity would have a direct result on the Young's modulus.

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5. Applicant argues, "...Ishihara merely discloses controlling the porosity by adjusting the contents of components such as carbon powder, kaolin, talc and aluminum hydroxide (paragraph [0028]). However, this disclosure only relates to the method of manufacturing an exhaust gas purifying filter, not plugging materials" (Remarks, Pg 5).

EXAMINER'S RESPONSE: The Examiner notes the plugging materials are a component of the exhaust gas purifying filter and therefore the method of controlling the porosity taught by Ishihara et al. applies to the plugs as well. However, the components of carbon powder, kaolin, talc and aluminum hydroxide are the components for manufacturing the cordierite material. It is unclear from the disclosure of Ishihara et al. how the porosity between the cell walls and the plugging material is modified without changing the composition of the cordierite, which would suggest other differences (besides the porosity) between the plugging material and the cell walls of the honeycomb taught by Ishihara et al. For this reason, Applicant's arguments with respect to the rejection(s) of claim(s) 1, 4, 6, 8, 24, & 25 under 35 U.S.C §103(a) over Ishihara et al. have been fully considered and are persuasive. Therefore, the rejection has been withdrawn.

However, upon further consideration, the Examiner notes Ichikawa et al., like Applicant, teach the composition of the cell walls and the plug material should remain the same and the porosity is adjusted by the use of a pore forming agent. Therefore the Examiner maintains the rejections over Ichikawa et al. (U.S. Patent No. 5,595,581), Shaffer (U.S. Patent No. 4,904,625), and Hamanaka et al. (WO 2002/074417).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NICOLE T. GUGLIOTTA whose telephone number is (571)270-1552. The examiner can normally be reached on M - F 8:30 a.m. - 6 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/D. Lawrence Tarazano/
Supervisory Patent Examiner, Art Unit 1786

/NICOLE T GUGLIOTTA/
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